In the Claims:

Please amend Claims 1, 2, and 6, cancel Claims 3, 4, and 5, withdraw Claims 7 and 8, and add the following new Claim 9:

1. (Currently amended) A method for correcting illumination nonuniformity across an illumination area during the synthesis of an array of oligomers from monomers, the illumination area being illuminated by light directed to the illumination area by a micromirror array, the method comprising the steps of:

measuring the illumination intensity of at least two oligomer synthesis positions at different positions in the illumination area, each of the synthesis positions corresponding to a single micromirror in the micromirror array;

evaluating mathematically the difference in illumination intensity between the at least two oligomer synthesis positions to identify a first synthesis position illuminated more brightly and a second synthesis position illuminated less brightly; and

adjusting the illumination intensity of the light directed to the first ~~brighter~~ synthesis position to match that of the light directed to the second ~~less bright~~ synthesis position by reducing the illumination time in which the micromirror corresponding to the first synthesis position directs light to the first synthesis position as compared to the illumination time in which the micromirror corresponding the second synthesis position directs light to the second synthesis position.

2. (Currently amended) The method of Claim 1, wherein the adjusting of illumination intensity of the first synthesis position ~~brighter positions~~ to match that of the second synthesis ~~a less bright~~ position is accomplished by reducing the illumination time of the brighter positions during a ~~one~~ protection group deprotection period in which light is directed to the illumination area to deprotect chemical protecting groups.

3-5. (Cancelled)

6. (Currently amended) The method of Claim 1, further comprising the steps of:

measuring the adjusted illumination intensity of each oligomer synthesis position; and

further adjusting the illumination intensities of each of the synthesis positions for higher uniformity across the entire illumination area.

7. (Withdrawn) An apparatus for synthesizing arrays of oligomers such as DNA probes and polypeptides, the apparatus comprising:

(i) a flow cell having one or more reaction chambers in which monomer addition reactions can be conducted;

(ii) a light source providing a light beam;

(iii) an array of optical elements placed to receive the light beam from the light source and arranged such that each element of the array can be positioned to direct light along an optical axis or to not direct light along the optical axis;

(iv) projection optics capable of receiving the light reflected from the array of optical elements along the optical axis and imaging the pattern of the optical elements onto the flow cell; and

(v) an optical element switch mechanism capable of adjusting the durations of on and off positions of each optical element during one protection group deprotection period to correct for nonuniformity in illumination intensity of the light that the projection optics project onto the flow cell.

8. (Withdrawn) An apparatus for synthesizing arrays of oligomers such as DNA probes and polypeptides, the apparatus comprising:

(i) a flow cell having one or more reaction chambers in which monomer addition reactions can be conducted;

(ii) a light source providing a light beam;

(iii) an array of optical elements placed to receive the light beam from the light source and arranged such that each element of the array can be positioned to direct light along an optical axis or to not direct light along the optical axis;

(iv) projection optics capable of receiving the light reflected from the array of optical elements along the optical axis and imaging the pattern of the optical elements onto the flow cell; and

(v) a lithographic mask placed between the projection optics and the flow cell with different areas of the mask darkened to different gray scales to correct for nonuniformity in illumination intensity of the light that the projection optics project onto the flow cell.

9. (New) A method for correcting illumination nonuniformity across an illumination area during the synthesis of an array of oligomers from monomers, the illumination area being illuminated by light directed from a micromirror array to the illumination area, the method comprising the steps of:

measuring the illumination intensity of at least two oligomer synthesis positions at different positions in the illumination area, each of the positions corresponding to the light directed from a single micromirror in the micromirror array;

evaluating mathematically the difference in illumination intensity between the at least two oligomer synthesis positions, the evaluation revealing that one of the synthesis positions is more brightly illuminated than the other synthesis position which is less brightly illuminated; and

adjusting the illumination intensity of the light directed to the more brightly illuminated synthesis position to match that of the light directed to the less brightly illuminated synthesis position, the adjustment being accomplished by adjusting the duty cycle of the micromirror corresponding to the more brightly illuminated synthesis position so that it directs light to the more brightly illuminated synthesis position for a time period less than the micromirror corresponding to the less brightly illuminated synthesis position.